

Peterson 18

Serial No. 09/915,963

**Claims Listing**

1           1.       (Canceled)

1           2.       (Canceled)

1           3.       (Currently Amended) An antenna structure comprising:  
2  
3           at least one antenna element, the at least one antenna element having at least one  
4           taper; and  
5  
6           a symmetrical finite ground plane coupled with the at least one antenna element;  
7  
8           wherein the at least one antenna element comprises a traveling wave antenna supporting a  
9           phase velocity greater than the speed of light and~~The antenna structure of Claim 1,~~  
10          wherein the taper comprises a linear profile, a linear constant profile, a broken-linear  
11          profile, an exponential profile, an exponential constant profile, a tangential profile, a step-  
12          constant profile, or a parabolic profile.

1           4.       (Currently Amended) An antenna structure comprising:  
2  
3           at least one antenna element, the at least one antenna element having at least one  
4           taper; and  
5  
6           a symmetrical finite ground plane coupled with the at least one antenna element;  
7

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8 | wherein the at least one antenna element comprises a traveling wave antenna supporting a  
9 | phase velocity greater than the speed of light and the antenna structure of Claim 1,  
10 | wherein the antenna structure supports a cigar-like directional three-dimensional beam  
11 | pattern and a butterfly wing-like directional three-dimensional beam pattern.

1 | 5. (Currently Amended) The antenna structure of Claims 3 or 4 ~~Claim 4~~,  
2 | wherein the at least one antenna element is positioned at an angle from the symmetrical  
3 | ground plane.

1 | 6. (Original) The antenna structure of Claim 5, wherein the angle is about 90  
2 | degrees with respect to the x-, y- and z- axes.

1 | 7. (Currently Amended) The antenna structure of Claims 3 or 4 ~~Claim 1~~,  
2 | wherein the at least one antenna element is coupled with the symmetrical ground plane by  
3 | means of an unbalanced impedance.

1 | 8. (Original) The antenna structure of Claim 7, wherein the unbalanced  
2 | impedance comprises a coaxial cable.

1 | 9. (Original) The antenna structure of Claim 7, wherein a first conductor of  
2 | the unbalanced impedance mechanically couples the at least one antenna element with the  
3 | symmetrical ground plane.

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1           **10.**    (Currently Amended) The antenna structure of Claims 3 or 4~~Claim 1~~,  
2    wherein the symmetrical ground plane is disk shaped.

1           **11.**    (Canceled)

1           **12.**    (Canceled)

1           **13.**    (Currently Amended) An antenna structure comprising:  
2  
3    an array of at least two antenna elements, each antenna element having at least  
4    one taper;  
5  
6    a symmetrical finite ground plane; and  
7  
8    an unbalanced impedance for coupling the array of at least two antenna elements  
9    with the symmetrical ground plane;  
10  
11   wherein at least one antenna element of the array comprises a traveling wave antenna  
12   supporting a phase velocity greater than the speed of light andThe antenna structure of  
13   ~~Claim 11~~, wherein the taper of at least one antenna element of the array comprises a  
14   linear profile, a linear constant profile, a broken-linear profile, an exponential profile, an  
15   exponential constant profile, a tangential profile, a step-constant profile, or a parabolic  
16   profile.

1           **14.**    (Currently Amended) An antenna structure comprising:  
2

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3     an array of at least two antenna elements, each antenna element having at least  
4     one taper;  
5  
6     a symmetrical finite ground plane; and  
7  
8     an unbalanced impedance for coupling the array of at least two antenna elements  
9     with the symmetrical ground plane;  
10  
11    wherein at least one antenna element of the array comprises a traveling wave antenna  
12    supporting a phase velocity greater than the speed of light and  
13    ~~The antenna structure of~~  
14    ~~Claim 11, wherein each antenna element of the array supports a cigar-like directional~~  
15    ~~three-dimensional beam pattern and a butterfly wing-like directional three-dimensional~~  
   ~~beam pattern.~~

1     **15.**    (Currently Amended) The antenna structure of Claims 13 or 14~~Claim 11,~~  
2     wherein each antenna element of the array is positioned at an angle from the symmetrical  
3     ground plane.

1     **16.**    (Original) The antenna structure of Claim 15, wherein the angle for each  
2     antenna element is about 90 degrees with respect to the x-, y- and z- axes.

1     **17.**    (Currently Amended) The antenna structure of Claims 13 or 14~~Claim 11,~~  
2     wherein the unbalanced impedance comprises a coaxial cable.

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1           **18.**     (Original) The antenna structure of Claim 17, wherein a first conductor of  
2     the unbalanced impedance mechanically couples each antenna element of the array with  
3     the symmetrical ground plane.

1           **19.**     (Currently Amended) The antenna structure of Claims 13 or 14~~Claim 14~~,  
2     wherein the symmetrical ground plane is disk shaped.

1           **20.**     (Currently Amended) The antenna structure of Claims 13 or 14~~Claim 11~~,  
2     further comprising a slow wave antenna to widen the directivity of the antenna structure.

1           **21.**     (Canceled)

1           **22.**     (Currently Amended) An apparatus comprising:  
2  
3     a transceiver; and  
4  
5     an antenna structure for radiating or capturing electromagnetic energy from or to  
6     the transceiver comprising:  
7  
8           at least one antenna element having at least one taper, the taper comprising  
9           a linear profile, a linear constant profile, a broken-linear profile, an  
10          exponential profile, an exponential constant profile, a tangential profile, a  
11          step-constant profile, or a parabolic profile;  
12

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13 |           a symmetrical disk shaped finite ground plane, the at least one antenna  
14 |           element being positioned at an angle from the symmetrical disk shaped  
15 |           finite ground plane; and  
16 |  
17 |           an unbalanced impedance for coupling the at least one antenna element  
18 |           with the symmetrical disk shaped finite ground plane;  
19 |  
20 |   wherein the at least one antenna element comprises a traveling wave antenna supporting a  
21 |   phase velocity greater than the speed of light and the apparatus of Claim 21, wherein the  
22 |   at least one antenna element supports a cigar-like directional three-dimensional beam  
23 |   pattern and a butterfly wing-like directional three- dimensional beam pattern.

1 |           **23.**   (Currently Amended) The antenna structure of Claim 2122, wherein the  
2 |   angle is about 90 degrees with respect to the x-, y- and z- axes.

1 |           **24.**   (Currently Amended) The antenna structure of Claim ~~24~~22, wherein the  
2 |   unbalanced impedance comprises a coaxial cable.

1 |           **25.**   (Currently Amended) The antenna structure of Claim 2122, wherein a first  
2 |   conductor of the unbalanced impedance mechanically couples the at least one antenna  
3 |   element with the symmetrical ground plane.